

CE 603– PSAD [Engr. Calaque, Dario Jr. A]

2ND QUIZ

INSTRUCTIONS:

- a. CHEATING IS PROHIBITED! Mind your own paper. Any act of cheating (using of cellular phones, books, and lecture materials during examination, copying answers from your seatmate, etc.) will result to failure of examination.
 - b. No borrowing of calculator.
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01. A stone is thrown vertically up from the ground with a velocity of 90m/sec. How long must one wait before dropping a second stone from the top of a tower 180m high if the two stones are to pass each other 60m from the top of the tower?

- a) 12.7sec
- b) 10.5sec
- c) 13.4sec**
- d) 11.3sec

02. A stone is dropped from the deck of Mactan Bridge. The sound of the splash reaches the deck 3 seconds later. If the sound travels 342m/s in still air, how high is the deck of Mactan Bridge above the water?

- a) 40.6m**
- b) 30.6m
- c) 20.6m
- d) 10.6m

03. A mortar fires a projectile at an angle of 60degrees with the horizontal and a muzzle velocity of 60m/s. An enemy tank is advancing directly towards the mortar on a level ground at an average speed of 6m/sec. What should be the distance from the mortar to the tank at the instant the mortar is fired in order to hit the tank?

- a) 395.2m
- b) 381.4m**
- c) 305.2m
- d) 311.1m

04. The spring has a normal length of 250mm. It is then compressed to half its length and the blocks are suddenly released from rest. Determine the velocity of the heavier block when the spring is again 250mm long. Spring constant is 10N/mm. The mass of A is 30kgs while that of B is 15kgs.

- a) 2.33m/s
- b) 1.04m/s
- c) 2.64m/s
- d) 1.32m/s**

05. A wooden block having a weight of 50N is placed at a distance of 1.5m from the center of a circular platform rotating at a speed of 2 radians per second. Determine the minimum coefficient of friction of the blocks so that it will not slide. Radius of the circular platform is 3m.

a) 0.61

b) 0.51

c) 0.41

d) 0.31

06. An automobile starting from rest, speeds up to 12m/sec with a constant acceleration of 1m/sec runs at this speed for a time and finally comes to rest with a deceleration of 1.5m/s^2 . If the total distance traveled is 480m, find the total time required.

a) 30sec

b) 40sec

c) 50sec

d) 60secs

07. A ball at the end of a cord 121cm long is swinging in a complete vertical circle with just enough velocity to keep it in the circle at the top. If the ball is release from the cord where it is at the top point of its path, where will it strike the ground 245cm below the center of the circle.

a) 105cm

b) 298cm

c) 376cm

d) 588cm

08. At what height "h" above the billiard table surface should a billiard ball of radius 3cm be struck by a horizontal impact in order that the ball will start moving with no friction between the ball and the table?

a) 4.2cm

b) 3.2cm

c) 6.2cm

d) 7.2cm

09. A 100kg body moves to the right at 5m/s and another body of mass W moves to the left at 3m/s. They meet each other and after impact the 100 kg body rebounds to the left at 2m/s. Determine the mass of other body if the coefficient of restitution is 0.50.

a) 120kgs

b) 130kgs

c) 140kgs

d) 150kgs

10. An auto equipped with only front wheel brakes, has a wheel base of 3.0m with its center of gravity located 1.5m ahead of rear wheels and 0.90 m above the pavement. If $f = 0.80$ at the tires, compute the minimum distances in which the auto can be brought to rest from a speed of 100kph if the driver's reaction time before applying the brakes is $3/4$ sec.

- a) 66.45m
- b) 75.56m
- c) 87.45m
- d) 95.56m**

11. A box slides from rest from point A down a plane inclined 30degrees to the horizontal. After reaching the bottom of the plane, the box moves on horizontal floor at a distance of 2m before coming to rest. If the coefficient of friction between the box and the plane and between the box and the floor is 0.40, what is the distance of point "A" from the intersection of plane and the floor?

- a) 3.33m
- b) 12.84m
- c) 5.21m**
- d) 9.43m

12. A 300kgs block is in contact with a level plane whose coefficient of kinetic friction is 0.10. If the block is acted upon by a horizontal force of 50kgs, what time will elapse before the block reaches a velocity of 48.3m/min from rest? If the 50kgs is then removed, how much longer will the block continue to move?

- a) 15.08sec and 11.05sec, respectively
- b) 14.08sec and 10.05sec, respectively
- c) 13.08sec and 9.05sec, respectively
- d) 12.08sec and 8.05sec, respectively**

13. The rated speed of a highway curve of 100m radius is 65kph. If the coefficient of friction between the tires and the road is 0.60, what is the maximum speed at which a car can round the curve without exceeding?

- a) 122kph**
- b) 133kph
- c) 144kph
- d) 155kph

14. A homogeneous sphere rolls down an inclined plane making an angle of 30degrees with the horizontal. Determine the minimum value of the coefficient of friction which will prevent slipping.

- a) 0.17**
- b) 0.27

c) 0.37

d) 0.47

15. A 400N bag of cement starts from rest and slides 12m down a roof with slope of 3 horizontal to 1 vertical and a coefficient of friction of 0.20. If the vertical distance from the edge of roof to the ground is 10m, how far from the wall will the bag of cement strike the ground?

a) 6.54m

b) 9.22m

c) 7.33m

d) 8.95m

-----Nothing Follows-----